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P.O. Box 254
Branford, CT 06405

Comments on the Islander East Pipeline Project

**by the
Branford Land Trust
Branford, Connecticut**



November 5, 2003



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"The mission of the Branford Land Trust is to preserve open space in Branford and to promote our community's appreciation of Branford's diverse natural features."

November 5, 2003

Mr. Branden Blum
Senior Counselor
c/o Office of Assistant General Counsel for Ocean Services
National Oceanic and Atmospheric Administration
U.S. Department of Commerce
1305 East-West Highway
Room 6111, SSMC-4
Silver Spring, MD 20910

Dear Mr. Blum:

The Branford Land Trust offers the following comments about Islander East's plan to construct a natural gas pipeline through the coastal and marine resources of Branford, Connecticut and the adjoining waters of Long Island Sound. The area through which Islander East proposes to construct the pipeline has been identified as a specific habitat area of particular regional significance to fish and wildlife resources that is in need of protection by the U. S. Fish & Wildlife Service in a 1991 report entitled Northeast Coastal Areas Study: Significant Coastal Habitats of Southern New England and Portions of Long Island, New York. As such, it should be avoided by disruptive and damaging activities such as this pipeline unless absolutely no other alternative routes are available. Islander East's plan fails to consider less environmentally damaging alternative routes and fails to provide a description of alternative methodology and route adjustments that will be used if the planned horizontal directional drilling of the transition from the Connecticut upland to Long Island Sound fails. For these reasons, the Branford Land Trust supports the finding by the Connecticut Department of Environmental Protection that the project is inconsistent with the Connecticut Coastal Zone Management Plan.

Islander East has proposed to use a horizontal directional drill (HDD) to install the pipeline at the point where it passes from upland areas into Long Island Sound. It has not, however, provided a contingency plan for how it will attempt to proceed in the event that it is unable to successfully complete the HDD. For the reasons discussed in this submission, a failure of the HDD will unavoidably lead to significantly more environmental damage to Branford's coastal resources than the plan that was evaluated by the Final Environmental Impact Statement. (The FEIS did not consider conventional alternatives to the HDD.)

Examination of the proposed route of the pipeline reveals only two options that would not require a major readjustment of the route. These are shown by the broken orange lines on the attached maps, entitled "Possible Non-HDD Entry Routes?". Both options would require trenching through more than 3500 feet of tidal flats and shallow sea bottom, increasing the amount of productive shellfish beds that would be destroyed and magnifying the likely sediment dispersion into Stony Creek Harbor and the inner Thimble Islands. In addition, each carries its own unique environmental impact.

One of the likely routes passes just to the west of the Tilcon facility, closer to the residences on Juniper Point, and crosses under the channel used by barges accessing the Tilcon facility. Given FERC's deference to avoiding residences whenever possible and the justifiable safety concerns that would arise from the possible impact of a swamping loaded barge (see attached photo) on a high pressure gas pipeline buried below the channel, it seems unlikely that this alternative would be selected if any other were available.

The second alternative route passes through the tidal wetlands to the east of the Tilcon facility. The route would have to pass well to the east of the Tilcon loading facility in order to avoid a series of settling ponds that capture the fine particles washed from the crushed stone at the Tilcon terminal prior to loading the barges. The exact route across the marsh is of course speculative, but it might start as far north as the Amtrak rail line. I have enclosed a photo of the entire marsh from Land Trust property to the east, as well as photos of portions of the marsh near the route indicated on the map. Once across the marsh, the pipeline would cross tidal flats and skirt the inner Thimble Islands where numerous rocks would present challenges to conventional trenching that might require blasting. I have also enclosed a photo of the surf in this area during a moderate high-energy wind event in March of 2002 to indicate the conditions to which any trench in this area could be exposed.

The failure of Islander East to submit the plans for the conventional entry to Long Island Sound as part of the application for a permit for the project should by itself be a sufficient basis for a finding of inconsistency with the Coastal Zone Management Plan. Before any permit is issued, the Army Corps of Engineers and other advisory agencies such as the Environmental Protection Agency and the Department of Environmental Protection must be able to carefully evaluate the conventional alternative and determine if there is indeed an acceptable means by which the pipeline can enter the Sound if the HDD fails.

Without an acceptable conventional alternative to the HDD, there are two possible scenarios, both of which carry significant negative consequences if onshore construction is allowed to proceed before the HDD is successfully completed.

The first is that Army Corps would not approve an alternative conventional method to enter Long Island Sound and the project would be terminated after the onshore construction had been completed. In this case, all of the damage to the inland wetlands and watercourses that are inherent in the IE project, and which have been noted by the

Environmental Protection Agency, FERC and other commenters, will have occurred with no resulting benefit.

The second and more likely scenario is that the large cost incurred by IE to install the onshore portion of the pipeline will lead FERC, DEP and Army Corps to approve an entry into Long Island Sound by conventional trenching, blasting and dredging regardless of the associated environmental impact. IE appears to be counting on this by planning to construct the onshore portions in advance of the HDD. As noted above, such a conventional entry will most likely require trenching across at least a quarter mile of tidal wetlands and dredging nearly a mile across tidal flats and through water even more shallow than that in the current plan.

The potential consequences of allowing Islander East to proceed with onshore installation of the pipeline prior to the successful completion of the HDD are plain. Islander East will certainly counter that they must follow this schedule to meet the demand for gas on Long Island. As noted by the Land Trust in other filings, much of Islander's supposed demand is suspect. Islander East must not be allowed to manipulate the regulatory process to its advantage and to the detriment of the environment of Connecticut and Long Island Sound.

Respectfully submitted,



Joan Merrick
President

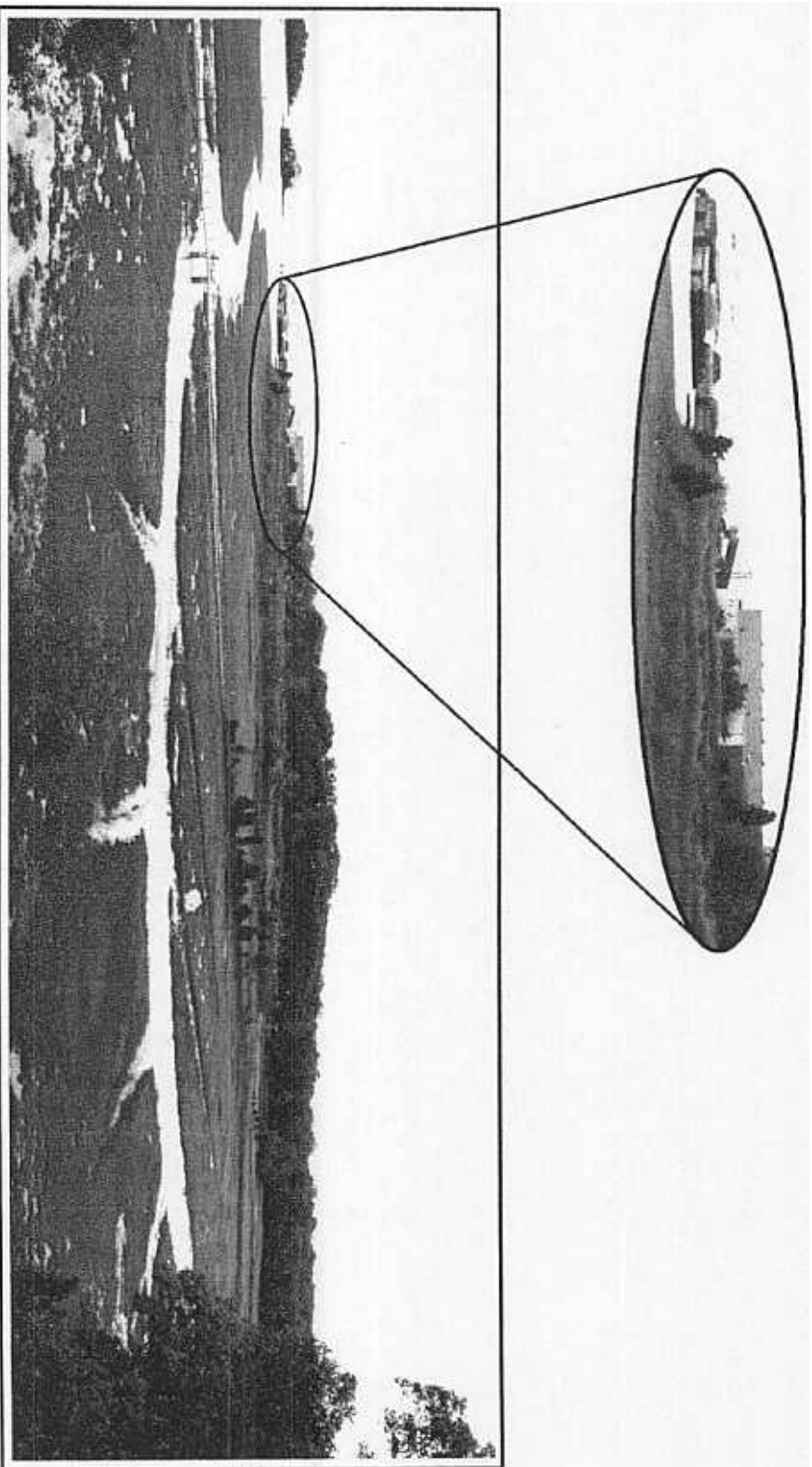


William Horne
Natural Resources Chair

Branford Land Trust
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This document involves pipeline location information and is not available at this Internet site due to homeland security-related considerations. This portion of the Islander East consistency appeal administrative record may be reviewed at NOAA's Office of General Counsel for Ocean Services, 1305 East-West Highway, Silver Spring, Maryland.

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Marsh east of Tilcon facility

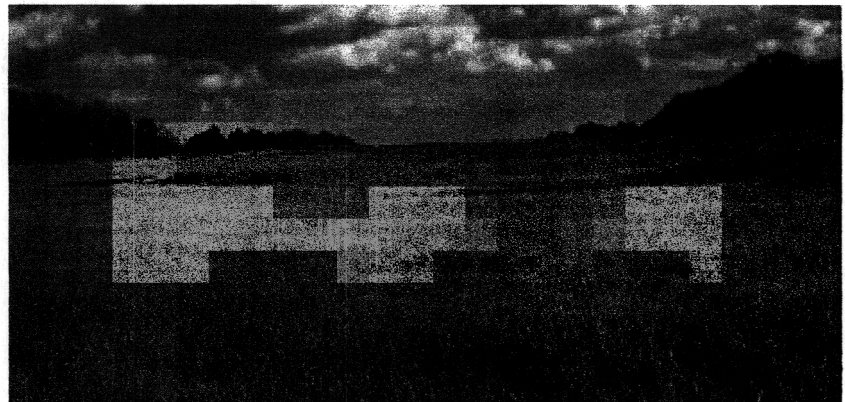


A conventional pipeline route through Long Creek Marsh would likely cross the heavily used Trolley Trail Nature Walk, maintained by the Town of Branford for recreational activities by residents of Branford and other Connecticut towns. The top photo shows the Trolley Trail looking west toward the Branford Steam Railroad track.

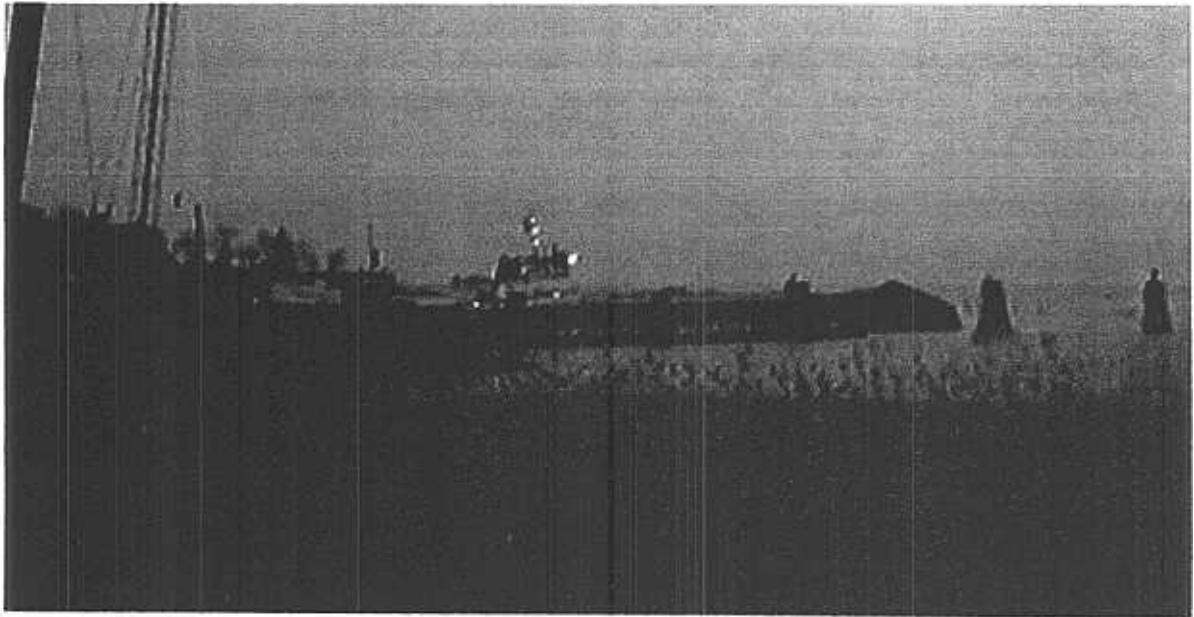


Marsh north of Trolley Trail, looking northwest toward the Branford Steam Railroad track and the Branford Land Trust Goss property beyond.

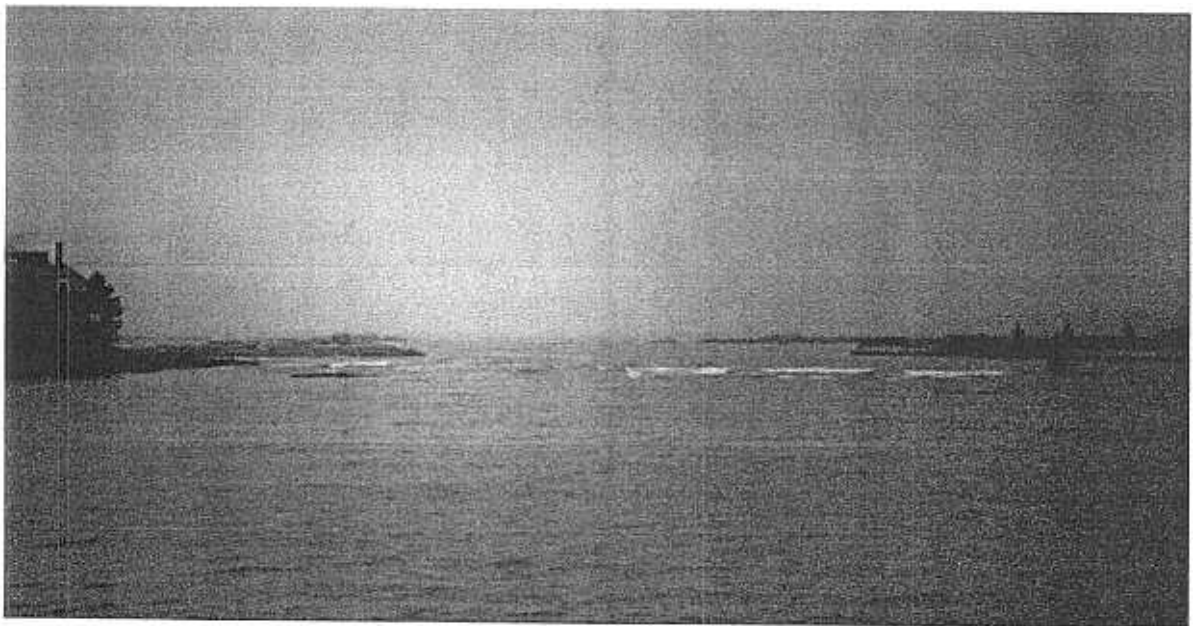
Long Creek Marsh looking southeast from Trolley Trail toward the mouth of the creek. The Tilcon settling ponds rise above the marsh to the right.



A pond south of the Trolley Trail and east of the Branford Steam Railroad track, looking southeast from near where the trail crosses the tracks.



**Unstable loaded barge swamping in Tilcon shipping channel
December, 1999**



**Surf between Tilcon dock and Lewis Island at low tide
March 30, 2002**

Press image to start



FINAL REPORT

**NORTHEAST COASTAL AREAS STUDY:
SIGNIFICANT COASTAL HABITATS
OF SOUTHERN NEW ENGLAND
AND PORTIONS OF LONG ISLAND, NEW YORK**

Submitted to

**U.S. HOUSE OF REPRESENTATIVES
COMMITTEE ON APPROPRIATIONS**

AND

**U.S. SENATE
COMMITTEE ON APPROPRIATIONS**

August 1991

PREPARED BY:

**U.S. FISH AND WILDLIFE SERVICE
Southern New England - Long Island Sound Coastal and Estuary Office
Box 307**

22 Northeast Coastal Areas Study
Significant Coastal Habitats
Site 22 (CT)

I. SITE NAME: New Haven Harbor Complex

II. LOCATION: This complex is centered primarily along the central coast of Connecticut on Long Island Sound in the New Haven Harbor area and areas to the east.

TOWNS: Branford, East Haven, Guilford, Hamden, Madison, New Haven, North Haven, Wallingford, West Haven

COUNTY: New Haven

STATE: Connecticut

USGS 7.5 MIN QUADS: Woodmont, Conn 41072-28; Branford, Conn 41072-37; Clinton, Conn 41072-35; Guilford, Conn 41072-36; New Haven, Conn 41072-38; Wallingford, Conn 41072-47; Mount Carmel, Conn 41072-48

USGS 30x60 MIN QUADS: Bridgeport 41073-A1; New Haven 41072-A1

III. GENERAL BOUNDARY: The outer, shoreward boundary of this largely nearshore water and tidal flat-dominated complex extends from Merwin Point, just south of Woodmont (Milford) east to Sachem Head (Guilford), a distance of approximately 14.5 miles (23 km). Enclosed within this boundary are the east and west shoreline areas around New Haven Harbor to the limit of anadromous fish passage on the West and Quinnipiac Rivers, including the Quinnipiac Meadows wetlands area and the North Haven and Wallingford sand plains north of New Haven Harbor. To the east of New Haven Harbor, the boundary incorporates the Branford River, Leetes Island and Joshua Cove marshes and tidal flats and nearshore waters of Long Island Sound for a distance averaging 1-2 miles (2-3 km) south of the shoreline. A number of important wildlife islands in the Branford-Guilford vicinity are included within this nearshore water boundary, most notably The Thimbles and Kelsey Island. The general boundary is outlined on the accompanying maps of this complex.

Specific habitat areas of particular regional significance to fish and wildlife resources that are in need of protection and/or management are: 1) Morse Point/Sandy Point, West Haven, including areas of intertidal mud and sand flats to the north and south of Sandy Point; 2) intertidal sand and mud flats along the west shore of New Haven Harbor in the vicinity of Long Wharf and City Point; 3) open waters of New Haven Harbor north of the outer breakwaters; 4) Quinnipiac River marshes; 5) Quinnipiac River sand plains; 6) anadromous fish runs of the West, Mill, Quinnipiac, Farm and Branford Rivers; 7) Leetes Island and Joshua Cove marshes (including Lost Lake) and tidal flats; 8) marshes and islands in Branford Harbor and River; and [REDACTED]. These individual areas are outlined within the accompanying general boundary map of the complex.

IV. OWNERSHIP/PROTECTED STATUS: A significant portion of this complex includes public coastal and river waters and wetlands, while the rest represents various mixtures of publicly and privately owned lands. Several of the islands are privately held as is most of the sand plains area along the Quinnipiac River.

V. GENERAL HABITAT DESCRIPTION: The major habitat types of fish, wildlife and plant significance in this complex are: 1) sand spits and beaches; 2) intertidal mud and sand flats; 3) tidal marshes; 4) sand plains; 5) anadromous fish streams and rivers; 6) undeveloped coastal islands; and 7) nearcoastal waters of importance to migrating and wintering waterfowl. The Quinnipiac River marshes contain a diversity of habitat types, including: salt marsh dominated by cordgrasses (*Spartina alterniflora* and *S. patens*); extensive brackish marshes of dense stands of cattail (*Typha angustifolia*) and common reed (*Phragmites australis*); freshwater tidal marsh with a high diversity of species including sweet flag (*Acorus calamus*), broad-leaved cattail (*T. latifolia*), reed canary grass (*Phalaris arundinacea*) and wild rice (*Zizania aquatica*); and narrow fringes of floodplain forest dominated by green ash (*Fraxinus pennsylvanica*), red maple (*Acer rubrum*), black willow (*Salix nigra*) and silver maple (*A. saccharinum*). Salt marshes elsewhere in this complex are similar to those in the lower section of the Quinnipiac Marshes. The sand plains of the Quinnipiac occur on glacial terraces and are only a small remnant of their former extent. In many places wind-formed dunes and hummocks are prominent surface features. The plains vary from almost totally bare, desert-like, sandy areas with sparse vegetation to open grasslands of little bluestem (*Schizachyrium scoparium*) and lichens to low scrubby woodlands and forests of black oak (*Quercus velutina*) and pitch pine (*Pinus rigida*). Most of the sand plains area is heavily industrialized with only a few open or remnant natural areas remaining, such as in Wallingford. The Thimbles and other small rocky islands in the Branford-Guilford vicinity are a mixture of bedrock and glacial materials with cobble beaches and various vegetation types, from beach grass (*Ammophila breviligulata*) dunes to mature coastal woodlands and thickets with abundant poison ivy (*Toxicodendron radicans*) and oriental bittersweet (*Celastrus orbiculatus*). Tidal amplitude at the entrance to New Haven Harbor is 6.2 feet (1.89 m).

VI. SIGNIFICANCE/UNIQUENESS OF AREA: The sand and mud flats at Long Wharf, City Point and Morse Point/Sandy Point in New Haven Harbor are regionally significant staging areas for large concentrations of migrating sandpipers, terns, plovers, turnstones and other shorebirds and waterfowl that feed on these flats to sustain them on their long journeys southward or northward. Shorebird species of special note include semipalmated sandpiper (*Calidris pusilla*), dunlin (*Calidris alpina*), ruddy turnstone (*Arenaria interpres*), least sandpiper (*Calidris minutilla*) and sanderling (*Calidris alba*). The New Haven tidal flats are reported by State biologists to be the most important wintering area for American black duck (*Anas rubripes*) in Connecticut. Morse Point currently supports nesting populations of piping plover (*Charadrius melodus*), a U.S. Threatened species, and least tern (*Sterna antillarum*). Elsewhere in the complex, common terns (*Sterna hirundo*) nest on a few of the islands to the east of New Haven Harbor.

The open water areas and tidal flats in New Haven Harbor and the nearshore area south of Guilford, Branford and East Haven contain some of the largest and most important concentrations of wintering and migrating waterfowl along the Connecticut coast, especially American black duck, canvasback (*Aythya valisineria*), American wigeon (*Anas americana*), greater and lesser scaup (*Aythya marila* and *Aythya affinis*, respectively), common goldeneye (*Bucephala clangula*) and three species of scoter (*Melanitta* spp.). Wading bird rookeries are established on a few of the outer Thimbles, mostly snowy egret (*Egretta thula*), great egret (*Casmerodius albus*) and black-crowned night-heron (*Nycticorax nycticorax*). The nearshore areas also contain abundant shellfish beds, particularly for American oyster (*Crassostrea virginica*) and hard-shelled clams (*Mercenaria mercenaria*). The river systems in this complex all have anadromous fish runs in those reaches

without barriers to fish passage. Anadromous fish using these rivers include American shad (*Alosa sapidissima*), sea-run brown trout (*Salmo trutta*), alewife (*Alosa pseudoharengus*), blueback herring (*Alosa aestivalis*), striped bass (*Morone saxatilis*) and white perch (*Morone americana*). New Haven Harbor is an important spawning and nursery area for winter flounder (*Pseudopleuronectes americanus*) and is heavily used by fishermen. Finfish common to this area include blackfish (*Tautoga onitis*), bluefish (*Pomatomus saltatrix*), weakfish (*Cynoscion regalis*), summer flounder (*Paralichthys dentatus*), and striped bass (*Morone saxatilis*).

Both the Quinnipiac River marshes and the upstream sand plains are important areas of regional biological diversity. The sand plains are a regionally rare and unique habitat, similar to the Hempstead Plains of Long Island, which is also only a small remnant of its former extent. The Quinnipiac Marshes are extremely productive biologically, in spite of the heavy industrialization that lines its banks and its chemically polluted waters and soils, especially with heavy metals. Migratory waterfowl using these marshes for nesting include American black duck, mallard (*Anas platyrhynchos*) and gadwall (*Anas strepera*), while northern harrier (*Circus cyaneus*), snowy egret and pied-billed grebe (*Podilymbus podiceps*) are suspected breeders. The marshes are also prime overwintering habitat for rough-legged hawk (*Buteo lagopus*) and snowy owl (*Nyctea scandiaca*).

VII. THREATS: The large seasonal concentrations of wildlife utilizing the extensive tidal mud and sand flats and open waters of this complex are extremely vulnerable to an oil spill or hazardous chemical discharge, particularly in New Haven Harbor. [REDACTED]

[REDACTED], including waste and sewage disposal, stormwater discharge, shoreline development, erosion control projects, [REDACTED]. Heavy metal and PCB pollution of soils and waters is of special concern, as are contaminated sediments in portions of New Haven Harbor and Mill River due to stormwater, sewage treatment plant and industrial discharges. In spite of it all, however, significant wildlife populations continue to persist in this area, albeit at much reduced levels from former levels of abundance. Human-related disturbances to colonial beach-nesting terns and piping plovers, whether unintentionally or the result of purposeful intrusions into nesting areas and acts of vandalism, or from stray animals and unleashed cats and dogs, are of major concern at all known nesting localities in this area. There are several historical, but presently unoccupied, localities for breeding birds in this area, particularly for roseate tern (*Sterna dougallii*), a U.S. Endangered species. Such areas were likely abandoned due to disturbance.

VIII. CONSERVATION CONSIDERATIONS: Protection of the nearshore waters and intertidal flats from catastrophic events such as an oil spill or hazardous chemical discharge needs to be given the highest priority among resource concerns in this area. Attention needs to be focused not only on formulating oil spill contingency plans, but developing the highest degree of readiness to respond to such an event, particularly during critical times of the year when wildlife populations are at their peak and most vulnerable, such as spring and fall migrations and winter. Measures should also be sought and instituted, whether by regulation, zoning, planning, cooperative agreements or full-scale restoration programs such as the National Estuary Program, to restore, maintain, enhance and protect aquatic and terrestrial resources in this complex.

Opportunities should be identified to restore or enhance degraded wetlands, including control of common reed, and other coastal habitats in this complex to increase their value to fish and wildlife. In addition to wetland habitats, the New Haven sand plains should be given high priority by the State in identifying and implementing restoration opportunities for this unique ecosystem.

Disturbances to colonial nesting birds, whether sand beaches or island rookeries, need to be minimized or eliminated entirely. Human and stray animal intrusions into nesting areas during the critical nesting season (mid-April to August) should be prevented using a variety of methods, including fenced exclosures, posting, beach warden patrols, trapping of animals and public education. Pertinent tasks and objectives of the piping plover recovery plan should be identified and implemented on area beaches, especially those aimed at habitat restoration, enhancement and protection. A regional or basinwide conservation and management plan should be developed and implemented for protecting and enhancing wintering waterfowl populations in central and western Long Island Sound, in partnership with governmental agencies, private conservation groups and landowners.

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I. INTRODUCTION AND MAP

The coastal and estuarine area of southern New England and northern and eastern Long Island is characterized as an extensive and diverse interconnected system of sounds, bays, lagoons, coves, harbors, coastal streams, tidal rivers and shorelands extending from the western Narrows of Long Island Sound to the islands of Monomoy and Nantucket south of Cape Cod, Massachusetts and south to Montauk Point, New York. (See Map, Appendix A). This broad mixing zone of seawater and freshwater lying between the Atlantic Ocean and the coastal shorelands of Connecticut, Rhode Island, Massachusetts and New York, has been historically renowned for its rich fisheries, abundance of waterfowl, diverse wildlife, productive marshes, scenic beaches, and outstanding recreational opportunities. It has also been an area of unprecedented human population growth and massive urban coastline development that in recent decades has resulted in dramatic declines in its living resources and the large-scale loss and degradation of essential estuarine and coastal habitats. The extinction and extirpation of several species of plants and animals in this area and population declines of others, and consequent biological diminution of the region, can be attributed to many factors, but most prominent are the destruction of natural habitats through dredging, filling, ditching, and draining of wetlands, highway and building construction, and pollution of sediments and waters by environmental contaminants such as chlorinated hydrocarbons, heavy metals, nutrients associated with various human activities and oil. Other factors include overharvesting, intensive recreational use of shoreline beaches and expanding populations of certain nuisance species and their competitive displacement of other species.

Congress, in recognizing the biological and economic importance of the living resources and natural values of the Northeast coastal area both to the region and the Nation as a whole, appropriated \$150,000 in FY 1990 for the Fish and Wildlife Service (Service) to conduct a study that would identify those areas in southern New England and Long Island in need of protection for fish and wildlife habitat and the preservation of natural diversity. Specifically, the House Appropriations Committee directed that:

The \$150,000 provided for a study of the coastal areas of Southern New England and Long Island, New York, includes, but is not limited to, Long Island Sound, Great Peconic Bay, Rhode Island Sound, Narragansett Bay, Buzzards Bay, Nantucket Sound, and the Lower Connecticut River. The study shall include an inventory of the natural values of these areas and subsequent identification of areas in most need of protection for fish and wildlife habitat, endangered species habitat, migratory waterfowl values, and the preservation of biological diversity. The Committee expects the Service to report its findings by March 1, 1990.

This final report, prepared in response to the above Congressional directive, outlines the geographic scope of the project as well as the methodologies used to delineate the study area boundary and to identify coastal species and habitat types included in the inventory. The major focus of this document is a compendium and individual description of regionally significant habitats and habitat complexes in need of protection. The list of habitat areas was developed after extensive consultation with regional biologists in the Federal and State governments and numerous conservation organizations and universities. Nevertheless, differences in interpretation may exist among regional biologists and land managers as to what constitutes "significance" or "importance" and to what extent an area may

be viewed as needing protection. As used in this report, "significance" of a site or resource refers to its relative regional importance to one or more life history stages or seasonal use periods of Federal trust species, defined in Section III-B and listed in Appendix B, and is not meant to infer any statistical level of significance or quantitative ranking system. For example, the presence of a population, regardless of size, of a U.S. Endangered or Threatened species, the occurrence of an exemplary and undisturbed stand of a regionally scarce community type, a large wintering concentration of waterfowl in numbers or densities considerably greater than what is generally encountered in the region, areas with a high diversity of trust species, a highly vulnerable breeding or spawning area of a fish or bird species that has been substantially reduced or qualitatively degraded from historical times, may all be considered "regionally significant" sites or resources in this report. Periodic re-evaluation of the data and criteria presented will be valuable in maintaining the usefulness of this document.

It is important to note that recommendations for protection that are provided in this report are for planning purposes and do not represent a budgetary commitment, particularly for acquisition, by the Department of the Interior to this project. Any increase above the President's Budget request will need to be offset by corresponding reductions in other projects or programs so that deficit reduction targets can be met. In addition, these areas have not yet been nationally evaluated by the Service in accordance with its Land Acquisition Priority System. Many of the areas identified in this report are already being managed to one degree or another for conservation purposes and are acknowledged here not only for their individual value to fish and wildlife resources but as being part of more extensive habitat complexes requiring a consistent management approach at the ecosystem level.

II. SCOPE OF PROJECT

The study area includes three priority estuaries under the EPA's National Estuary Program: Narragansett Bay, Buzzards Bay and Long Island Sound. Each of these Estuaries of National Significance is currently being assessed by a cooperative effort involving Federal, State, interstate and local agencies, as well as research institutions, educational organizations and citizens' groups. Peconic Bay, at the eastern end of Long Island (NY) in the study area, is in the process of being added to this list of priority estuaries by the EPA. This area is also of considerable interest to the State of New York and The Nature Conservancy as a potential bioserve. (Briefly, The Nature Conservancy defines a bioserve as an area having an integrated landscape with naturally functioning ecological processes, and containing outstanding examples of ecosystems, natural communities, and species which are endangered or inadequately protected.)

The Fish and Wildlife Service temporarily established the Northeast Estuary Office in Charlestown, Rhode Island, in January 1990, to conduct and direct the study. Collocated with the Ninigret National Wildlife Refuge, this office is part of the Service's Northeast Coastal and Estuary Program in Region 5. The Service is proposing to establish the office as a permanent station in FY 1992 to implement the study and to participate in the ongoing EPA National Estuary Programs.

The project has worked closely with The Nature Conservancy's Northeast Regional Office and State chapters, and Natural Heritage Programs for the States of Massachusetts, Rhode Island, Connecticut and New York. Other essential cooperators have included the various State natural resource agencies and universities in the four-state area and the following Federal agencies: Environmental Protection Agency (EPA), National Marine Fisheries Service, National Ocean Service, National Park Service and various divisions, research centers and programs within the Fish and Wildlife Service. The National Audubon Society provided substantial technical assistance regarding certain geographical areas.

The FY 90 House Appropriations Committee language originally directed the Service to complete the present study and submit a final report by March 1990. At the request of the Service the Committee agreed to extend the due date for the final report to March 1991. An interim report was prepared and submitted to the Congress on July 25, 1990, that provided summary information on the status of the project to date as well as a preliminary identification and description of regionally significant fish, wildlife and plant habitats in need of protection. Subsequent to that, the Service requested and received from Congress an additional three-month extension of the report's due date.

III. METHODOLOGY

A. Delineation of Study Area Boundary:

The House Appropriations Committee described the study area as "...to include, but not be limited to: Long Island Sound, Great Peconic Bay, Rhode Island Sound, Narragansett Bay, Buzzards Bay, Nantucket Sound and the lower Connecticut River." Following this general guidance, the Service determined the study area as encompassing the sounds, bays, estuaries, tidal rivers and adjacent shorelands from Nantucket Sound, including the islands of Monomoy, Nantucket and Martha's

Vineyard, to the western terminus of Long Island Sound. (See map, Appendix A.) This area also includes Gardiners and Peconic Bays between the two forks of eastern Long Island, but the Service concluded that it did not include the inner lagoons and bays along the south shore of Long Island that were part of the New York Bight system, even though considerable interest was expressed by several Congressmen from Long Island for this area to be included as part of the study. Because of both lack of funding and time to include these areas, the Service felt it would be more appropriate to conduct a separate study at some later date of significant habitats in the New York Bight area (Montauk Point, NY, to Cape May, NJ). It should be noted here that four significant fish and wildlife complexes along the south shore of Long Island have been included in this report, primarily because of the interest and assistance by the National Audubon Society, who largely prepared these specific write-ups. In addition, because of the connection of the New York-New Jersey Harbor to Long Island Sound as well as the excellent report recently prepared by the Trust for Public Land and New York City Audubon Society identifying the value of and threats to this area, a significant heron rookery complex on Staten Island was also included. Other than these sites, no other areas on the south shore have been included and no analysis has been done in this area to determine other areas of significance, of which doubtlessly there are many.

In addition to the immediate coastline, the study area included coastal rivers and streams from their confluence with the estuary up to the limit of tidal influence or fall line. In the specific case of the Connecticut River, the project boundary was determined to extend to the dam at Holyoke, Massachusetts.

Due to the resource limitations of this study, however, and the current interest and consideration by Congress of legislation establishing a Connecticut River National Fish and Wildlife Refuge that calls for further study of the river, this study did not focus as much attention on the upper portion of the Connecticut River as it did on the lower tidal reaches. Should the proposed legislation be enacted, the northern, upstream reaches of the river should be carefully explored and evaluated for significant fish, wildlife and plant habitats in a manner similar to the present study.

For the most part, the landward or inland extent of the project's coastal boundary approximates that delineated by the State Coastal Zone Management Programs for New York, Connecticut, Rhode Island and Massachusetts, although in some cases the width of this zone has been broadened to include the estimated inland limit of influence of maritime climate and coastal processes. On the average, the width of this landward coastal zone is about five miles. The seaward extent of the study area is presently delineated by a line drawn from just offshore the southeastern tip of Cape Cod to southeastern Nantucket Island, and from the nearshore waters of Nantucket Island to Montauk Point, Long Island, NY.

B. Coastal Species of Special Emphasis:

The Service's principal approach in identifying significant habitats to be included in the project study area inventory was to focus on those sites of particular regional or national importance to critical life history stages of select coastal species. As an additional part of this process, the Service identified and evaluated areas of significant regional biological diversity and outstanding representatives of regional coastal community types in this same region.

In conjunction with the various project cooperators, the Service developed a list of southern New England and Long Island Coastal Species of Special Emphasis which it used in directing its efforts to identify habitat areas in need of protection. (See Appendix B.) These are primarily species of national or regional significance for which there is a clear Federal trust responsibility under one or more legislative authorities or mandates (e.g., Endangered Species Act, Marine Mammal Protection Act, Anadromous Fish Conservation Act, Migratory Bird Treaty Act, Fish and Wildlife Coordination Act) or which are considered in various regional planning documents (e.g., Regional Resource Plans, Fishery Management Plans, North American Waterfowl Management Plan) or are ecologically, commercially or recreationally important within the project study area. Many are species whose populations have seriously declined or are presently declining from historical levels of abundance in the region and/or are especially vulnerable to habitat loss and degradation, human disturbance, competition with exotic or nuisance species, overexploitation or environmental contaminants.

The list of Coastal Species of Special Emphasis contains 153 plant and animal species on which the Service concentrated its data collection efforts in this project. It includes 19 species of finfish, 9 shellfish, 5 reptiles, 2 amphibians, 61 bird species, 6 marine mammals, 7 terrestrial mammals, 12 invertebrates, and 32 plant species. This list is not an exhaustive accounting of all coastal species occurring in the study area, but, rather, represents those species of particular management concern on which the Service focused its inventory efforts.

C. Identification of Significant Habitats of Special Emphasis Species:

In this report, each of the significant, high-priority habitat sites and complexes of habitats is described individually and its approximate boundary delineated on a topographic map. These brief descriptions include the general physical and biological characteristics of each area, the significance, uniqueness or value of each area to Coastal Species of Special Emphasis and/or the biological diversity of the region, general ownership patterns, and threats to the ecological integrity of the site and/or species occurring there during critical life history stages. Also included for each site are conservation considerations developed by the Service on how to best protect these areas and the species which depend upon them. More detailed information on each of these sites is available through the Northeast Estuary Office in Charlestown, Rhode Island.

In identifying specific significant coastal habitats in need of protection, the Service focused on: 1) individual populations or occurrences of coastal species of special emphasis; 2) regionally or nationally significant habitat sites of special emphasis species and/or areas of exceptional biological diversity or community uniqueness; and 3) habitat complexes consisting of two or more and often several important and ecologically-linked habitats within a given geographic area. A knowledge of the distinctions between each of these approaches is necessary to understanding the rationale behind the identification and delineation of the sites presented in this report. They are as follows:

1) Individual Species Occurrences: Individual occurrences of coastal species of special emphasis were analyzed to identify areas important to one or more critical life history stages of these species, such as spawning, wintering and juvenile growth areas. Data were sought and collected on individual site occurrences, both current and historical, of 153 selected species ranging from small and local resident breeding populations and seasonal clusterings to larger metapopulations, overwintering

concentrations, migrating groups and anadromous fish runs. These data were analyzed for the entire four-state coastal and estuary study region. Distribution and locality information was collected and compiled at the most detailed scale and format available, generally on 1:24000 standard USGS topographic quadrangle maps. The bulk of this information was obtained from state Natural Heritage Programs and natural resource agencies, Federal agencies (Fish & Wildlife Service, National Marine Fisheries Service) and private conservation organizations, in particular The Nature Conservancy and the National Audubon Society. Individual occurrences and locations were pinpointed on base maps as precisely as the data would allow, either as point occurrences or larger areal delineations, often to the nearest second of latitude and longitude. This information is currently being entered into a computer-mapping program (MapInfo) to facilitate storage, retrieval and graphic presentation of data. Whenever possible or practical, all occurrences of a species in the study area were recorded, including historical locations, regardless of number of individuals at a site, population size, resident or breeding status or regional or national significance. In some instances, however, particularly in the case of widespread species showing considerable movement over the general area, such as certain waterfowl and fish, only the more stable and regularly-occurring concentrations were mapped.

2) Significant Habitats: Using these species occurrence data, important or potentially important, habitat sites were identified. Subsequent discussions with knowledgeable field biologists and field verification were undertaken to confirm the importance of these sites. In addition to obviously significant and exceptional sites, i.e., those supporting disproportionately large numbers or densities of a species or where breeding success and productivity are particularly high or above average, the data also served to identify important intermediate sites between major areas that function as migration or recruitment "stepping stones".

Prior to this project, many important habitat areas were already recognized for their value to fish and wildlife by various resource agencies and conservation organizations, at least from a statewide perspective, and were recommended to the study project for inclusion in the final report to Congress as significant habitats in need of protection. Because the Northeast Coastal Areas Study focused its data compilation and analysis efforts primarily on habitats of ecoregional, regional or national significance, differences were obviously to be expected between the two perspectives, although these were surprisingly few. In some instances, habitats viewed as significant or important to biologists or natural resource managers in a particular state may not have been felt to have the same significance when viewed in a broader regional context. Conversely, some areas thought to be of lesser value by a state because of their small size were, in fact, determined to be of regional importance as stepping stone areas between major population sites. In other words, candidate sites recommended by the states still needed to be evaluated and analyzed as part of the present study to determine their overall regional or national significance to fish, wildlife and plants in the southern New England - Long Island, NY, study area.

3) Habitat Complexes: The Service also identified significant habitat complexes through analysis of species occurrence data and consultation with others. These larger units generally consist of from two to several individual habitat or landform units that are each of importance to a single species or multiple species and which are either contiguous or in relatively close proximity to each other so as to allow their being recognized as a single, interrelated ecological unit, particularly from a natural

resource management perspective. Each of the habitat units will, in many instances, have been individually recognized as being important to either a single species or a group of species, often by an agency or group that is focused on a particular group of species. What the current study attempted to do is identify obvious linkages between significant sites that allow them to be viewed in a much larger and ecologically relevant context. It will be noted that the majority of significant coastal habitat sites identified in this report are primarily habitat complexes comprised of individual, smaller habitat units.

Habitat complexes generally belong to one of three categories:

A. Contiguous, similar habitats, e.g., linear stretches of beaches or dune systems running parallel to the coast, ridgetops or riparian corridors.

B. Contiguous dissimilar habitats, though geomorphologically, and often ecologically, related, e.g., barrier beach/lagoon/salt marsh/upland complexes or local watersheds.

C. Discontinuous, though not necessarily remote, similar habitats that form an essential part, if not the entirety, of a species' population or metapopulation. To a large extent, habitat complexes as viewed here are very close to the bioreserve concept, as defined earlier, currently being explored by The Nature Conservancy and efforts are being made to consider linking the two concepts closer in the future.

IV. PROTECTION STRATEGIES

A variety of approaches and strategies exists for the protection of valuable wildlife habitats; each provides different degrees of protection and requires different levels of commitment by regulatory agencies, conservation organizations and landowners. These techniques range from the establishment of conservation easements, cooperative management agreements, zoning and land-use regulations, comprehensive planning, enforcement of existing local, state and Federal regulations, tax incentives, mutual covenants and land exchanges to fee simple acquisition. All four states in the study region have enacted special laws to protect coastal wetlands; these laws vary considerably in their degree of protection. Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act of 1977 mandate a strong Federal role for protecting the Nation's coastal wetlands and have proved to be very effective regulatory mechanisms for protecting wetland habitats in general. Federal permits are required for most types of construction in estuarine wetlands. While the regulatory tools to protect coastal wetlands are in place, continued enforcement of existing laws is required to maintain the integrity of the remaining wetlands. The Endangered Species Act and Migratory Bird Treaty Act are also used extensively by the Fish and Wildlife Service and National Marine Fisheries Service to provide protection to species listed under them. In addition to regulation, the Coastal Barrier Resources Act of 1982 removes Federal subsidies and discourages development of designated coastal barriers and adjacent wetlands. Executive Order 11990 - "Protection of Wetlands" - requires Federal agencies to develop guidelines to minimize destruction and degradation of wetlands and to preserve and enhance wetland values.

Successful application of these protection mechanisms can be enhanced through their use in concert with each other and in partnership with all parties involved. Selection of the most appropriate and effective combination of protection techniques and strategies should be determined only through careful consideration of the unique conditions and circumstances that apply to each individual site or complex.

NORTHEAST COASTAL AREAS STUDY SIGNIFICANT COASTAL HABITATS

Key to Habitat Sites and Complexes:

1. The Narrows Complex
2. Three Harbors Area
3. Nissequogue River
4. Port Jefferson - Stony Brook Harbor Complex
5. Peconic River - Pinelands Complex
6. North Fork Beach Complex
7. Orient Point - Islands Complex
8. Gardiners Island and Point
9. Montauk Peninsula Complex
10. Acabonack Harbor Area
11. Shelter Island - Harbor Bays Complex
12. Noyack Bay Beaches
13. Cow Neck Complex
14. Flanders Bay Wetlands Complex
15. Moriches Bay
16. Great South Bay
17. South Oyster Bay
18. Hempstead Bay (East, Middle, West Bays)
19. Harbor Herons Rookery Complex
20. Norwalk Islands and Tidal Wetlands Complex
21. Lower Housatonic River - Great Meadows Marsh Complex
22. New Haven Harbor Complex
23. Falkner and Goose Islands
24. Greater Hammonasset Complex
25. Connecticut River and Tidal Wetlands Complex
26. Lower Thames River System
27. Fishers Island Sound Complex
28. Block Island
29. Chapman Swamp/Pawcatuck River
30. Maschaug Pond
31. Areas North and East of Truston Pond and Green Hill Swamp
32. Hundred Acre Cove/Palmer River Complex
33. Rhode Island Sound - Buzzards Bay Beach Complex
34. Buzzards Bay Colonial Bird Nesting and Feeding Areas
35. Sippewisset Marshes
36. Nantucket Sound Barrier Beach\Bay Complex
37. Hyannis Coastal Ponds Complex
38. Miacomet Moorlands, Nantucket Island
39. Muskeget and Tuckernuck Islands and Muskeget Channel
40. Martha's Vineyard Coastal Sandplain and Beach Complex

APPENDIX B
NORTHEAST COASTAL AREAS STUDY
U.S. FISH AND WILDLIFE SERVICE
SOUTHERN NEW ENGLAND-NEW YORK
COASTAL SPECIES OF SPECIAL EMPHASIS

The following species have been identified by the U.S. Fish and Wildlife Service's Northeast Estuary Program as being of national or regional significance and of special management concern in the coastal region of southern New England (MA, RI and CT) and New York. Many are species whose populations have declined or are presently declining from historical levels of abundance in the region and/or are especially vulnerable to habitat loss and degradation, disturbance, competition with exotic or nuisance species, overexploitation or environmental contaminants. Some groups, e.g. shellfish and certain finfish, while not especially rare or declining, are of considerable ecological, commercial or recreational importance in the region. The primary purposes of these species lists are to establish a base for identifying habitats in need of protection in the project area and to develop ecoregional strategies for the long-term protection, conservation, and monitoring of both species and habitats.

I. FINFISH: (Spawning areas, nursery and feeding grounds, migration pathways)

Shortnose sturgeon (*Acipenser brevirostrum*) E
Atlantic sturgeon (*Acipenser oxyrinchus*)
American shad (*Alosa sapidissima*)
Striped bass (*Morone saxatilis*)
Atlantic salmon (*Salmo salar*)
Bluefish (*Pomatomus saltatrix*)
Winter flounder (*Pseudopleuronectes americanus*)
Summer flounder, fluke (*Paralichthys dentatus*)
Weakfish (*Cynoscion regalis*)
Blackfish, Tautog (*Tautoga onitis*)
Scup or Porgy (*Stenotomus chrysops*)
Alewife (*Alosa pseudoharengus*)
Blueback herring (*Alosa aestivalis*)
Rainbow smelt (*Osmerus mordax*)
Menhaden (*Brevoortia tyrannus*)
American sandlance (*Ammodytes americanus*)
American eel (*Anguilla rostrata*)
Bay anchovy (*Anchoa mitchilli*)
Atlantic silverside (*Menidia menidia*)

E = U.S. Endangered Species

T = U.S. Threatened Species

1, 2 = Category 1 or 2 Candidate Species

II. MARINE/ESTUARINE SHELLFISH: (Major shellfish beds; horseshoe crab spawning areas)

American lobster (*Homarus americanus*)
Blue crab (*Callinectes sapidus*)

Horseshoe crab (*Limulus polyphemus*)
American oyster (*Crassostrea virginica*)
Hard-shelled clam or Quahog (*Mercenaria mercenaria*)
Soft-shelled clam (*Mya arenaria*)
Ocean quahog (*Arctica islandica*)
Surf clam (*Spisula solidissima*)
Bay scallop (*Aequipecten irradians*)

III. REPTILES AND AMPHIBIANS: (Nesting, breeding, nursery and feeding areas)

Northern diamondback terrapin (*Malaclemys t. terrapin*) 2
Sea Turtles: (Juvenile concentration areas)
Loggerhead (*Caretta caretta*) T
Green (*Chelonia mydas*) T
Atlantic or Kemp's Ridley (*Lepidochelys kempii*) E
Leatherback (*Dermochelys coriacea*) E
Tiger salamander (*Ambystoma tigrinum*)
Blue-spotted salamander (*Ambystoma laterale*)

IV. BIRDS:

A. Federally Listed/proposed/candidate species and Fish and Wildlife Service species of special management concern:

Roseate tern (*Sterna dougallii*) E
Gull-billed tern (*Sterna nilotica*)
Piping plover (*Charadrius melodus*) T
Northern harrier (*Circus cyaneus*)
Bald eagle (*Haliaeetus leucocephalus*) E
Osprey (*Pandion haliaetus*)
Peregrine falcon (*Falco peregrinus*) E,T
Short-eared owl (*Asio flammeus*)
American bittern (*Botaurus lentiginosus*)
Least bittern (*Ixobrychus exilis*)
Black rail (*Laterallus jamaicensis*)
Seaside sparrow (*Ammodramus maritimus*)
Common barn owl (*Tyto alba*)

B. Migrants: (Wintering concentrations and staging areas; resident breeding populations)

Common loon (*Gavia immer*)
Red-throated loon (*Gavia stellata*)
Horned grebe (*Podiceps auritus*)
Red-necked grebe (*Podiceps grisegena*)
Pied-billed grebe (*Podilymbus podiceps*)
Canada goose (*Branta canadensis*)
Atlantic brant (*Branta bernicla*)
Northern pintail (*Anas acuta*)

American wigeon (*Anas americana*)
 Mallard (*Anas platyrhynchos*)
 American black duck (*Anas rubripes*)
 Gadwall (*Anas strepera*)
 Canvasback (*Aythya valisineria*)
 Greater scaup (*Aythya marila*)
 Lesser scaup (*Aythya affinis*)
 Harlequin duck (*Histrionicus histrionicus*)
 Common eider (*Somateria mollissima*)
 Oldsquaw (*Clangula hyemalis*)
 Bufflehead (*Bucephala albeola*)
 Common goldeneye (*Bucephala clangula*)
 Scoters (*Melanitta fusca*, *M. nigra* and *M. perspicillata*)
 Hooded merganser (*Lophodytes cucullatus*)
 Red-breasted merganser (*Mergus serrator*)
 Clapper rail (*Rallus longirostris*)
 Sanderling (*Calidris alba*)
 Short-billed dowitcher (*Limnodromus griseus*)
 Whimbrel (*Numenius phaeopus*)
 Grasshopper sparrow (*Ammodramus savannarum*)
 C. Nesting Colonial Waterbirds:
 Double-crested cormorant (*Phalacrocorax auritus*)
 Little blue heron (*Egretta caerulea*)
 Tricolored heron (*Egretta tricolor*)
 Great egret (*Casmerodius albus*)
 Snowy egret (*Egretta thula*)
 Cattle egret (*Bubulcus ibis*)
 Black-crowned night-heron (*Nycticorax nycticorax*)
 Yellow-crowned night-heron (*Nyctanassa violacea*)
 Green-backed heron (*Butorides striatus*)
 Glossy ibis (*Plegadis falcinellus*)
 American oystercatcher (*Haematopus palliatus*)
 Laughing gull (*Larus atricilla*)
 Least tern (*Sterna antillarum*)
 Common tern (*Sterna hirundo*)
 Black skimmer (*Rynchops niger*)
 D. Nuisance Species: (Species of particular management concern because of impacts on other species)
 Mute swan (*Cygnus olor*)
 Herring gull (*Larus argentatus*)
 Great black-backed gull (*Larus marinus*)

V. MAMMALS

A. Marine Mammals: (Whale concentration and migration areas; seal pupping and hauling out sites)

Whales:

Minke (*Balaenoptera acutorostrata*)
Fin (*Balaenoptera physalus*) E
Humpback (*Megaptera novaeangliae*) E
Northern right whale (*Eubalaena glacialis*) E
Gray seal (*Halichoerus grypus*)
Harbor seal (*Phoca vitulina*)

B. Terrestrial Mammals: (Island endemics-Some of dubious taxonomic status)

Martha's Vineyard short-tailed shrew (*Blarina brevicauda longa*) 2
Nantucket short-tailed shrew (*Blarina brevicauda compacta*) 2
Small-footed myotis (*Myotis leibii*) 2
Monomoy white-footed mouse (*Peromyscus leucopus ammodytes*) 2
Martha's Vineyard white-footed mouse (*Peromyscus leucopus fuscus*) 2
Block Island meadow vole (*Microtus pennsylvanicus provectus*) 2
Beach or Muskeget Island vole (*Microtus breweri*) 2

VI. INVERTEBRATES:

American burying beetle (*Nicrophorus americanus*) E
Northeastern beach tiger beetle (*Cincindela d. dorsalis*) T
Puritan tiger beetle (*Cincindela puritana*) T
Decodon borer moth (*Papaipema sulphurata*) 2
Banded bog skimmer dragonfly (*Williamsonia lintneri*) 2
Lemmer's noctuid moth (*Lithophane lemmeri*) 2
Regal fritillary butterfly (*Speyeria idalia*) 2
Barrens bluet damselfly (*Enallagma recurvatum*)
Lateral bluet damselfly (*Enallagma laterale*)
Hessel's hairstreak (*Mitouri hesseli*)
Barrens buckmoth (*Hemileuca maia*)
Dwarf wedge mussel (*Alasmodonta heterodon*) E

VII. PLANTS:

A. Federally Listed:

Sandplain gerardia (*Agalinis acuta*) E

B. Federal Candidates:

Sea-beach pigweed (*Amaranthus pumilis*) 2
Nantucket serviceberry (*Amelanchier nantucketensis*) 2
Variable sedge (*Carex polymorpha*) 2
Spreading Tick-trefoil (*Desmodium humifusum*) 2
New England boneset (*Eupatorium leucolepis* var. *novae-angliae*) 2
Pine Barrens boneset (*Eupatorium resinosum*) 2
New England blazing-star (*Liatris borealis*) 2
Graves' beach plum (*Prunus maritima* var. *gravesii*) 2
Chaffseed (*Schwalbea americana*) 1
Long's bulrush (*Scirpus longii*) 2

C. Regional Species of Special Concern:

Annual peanut-grass (*Amphicarpum purshii*)
Eastern silvery aster (*Aster concolor*)
Bicknell's hawthorn (*Crataegus bicknellii*)
Sessile-leaved tick-trefoil (*Desmodium sessilifolium*)
Saltpond grass (*Diplachne maritima*)
Three-angled spike-sedge (*Eleocharis tricostata*)
Parker's pipewort (*Eriocaulon parkeri*)
Bushy rockrose (*Helianthemum dumosum*)
Creeping St. John's-wort (*Hypericum adpressum*)
Round-fruited false-loosestrife (*Ludwigia sphaerocarpa*)
Climbing fern (*Lygodium palmatum*)
Sea-beach knotweed (*Polygonum glaucum*)
Pondshore knotweed (*Polygonum puritanorum*)
Bald rush (*Psilocarya scirpoides*)
Torrey's mountain-mint (*Pycnanthemum torrei*)
Inundated horned-rush (*Rhynchospora inundata*)
Torrey's beak-rush (*Rhynchospora torreyana*)
Plymouth gentian (*Sabatia kennedyana*)
Quill-leaved arrowhead (*Sagittaria teres*)
Untubercled bulrush (*Scirpus etuberculatus*)
Coast violet (*Viola brittoniana*)

APPENDIX C

SHORELAND AND AQUATIC COASTAL HABITATS OF SPECIAL EMPHASIS SPECIES IN SOUTHERN NEW ENGLAND AND NEW YORK

A. Primary focus of the Northeast Coastal Areas Study is on those breeding/spawning areas, nursery areas, feeding/staging areas, wintering areas and migration pathways of importance to Federal trust species of regional or national significance, particularly those in the following groups:

- Migratory birds
- Anadromous fish
- Endangered species of fish, wildlife and plants (Federally listed, proposed and candidates)
- Marine mammals
- Native species populations on Federal lands
- Recreationally and commercially important species
- Ecologically significant species
- Depredating, nuisance, exotic and potentially invasive species

In addition, other habitats and areas of special emphasis are:

- Areas of significant biological diversity
- Outstanding representatives of Regional Coastal Community types

B. Significant Coastal Habitat Types* in Southern New England and Long Island

- Maritime grasslands
- Vegetated tidal wetlands (freshwater and brackish) with contiguous upland buffers
- Sandplain grasslands and heathlands
- Coastal Plain freshwater and brackish ponds
- Pitch Pine/Scrub Oak barrens
- Atlantic White Cedar swamps
- Colonial bird rookeries
- Relatively undisturbed sand beaches and contiguous dunelands
- Intertidal mud and sand flats
- Submerged aquatic vegetation beds
- Relatively undisturbed and free-flowing freshwater coastal streams
- Shellfish beds
- Floodplain forests
- Productive subtidal shoal areas
- Open peatlands
- Marine mammal pupping and hauling out islands (seal islands and rocks)

* Preferred or Important Habitats of Federal Trust Species/Species of Special Emphasis.